



## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification <sup>6</sup> :  D06N 7/00, A47G 27/04		A1	(11) International Publication Number: <b>WO 99/19557</b>  (43) International Publication Date: 22 April 1999 (22.04.99)
(21) International Application Number: PCT/US98/21487  (22) International Filing Date: 13 October 1998 (13.10.98)		WATERS, Liam [IE/US]; 724 Ridgecrest Road, LaGrange, GA 30240 (US). GRAY, Keith [US/US]; 575 Chastain Road #507, Kennesaw, GA 30144 (US).	
(30) Priority Data:  60/062,085 14 October 1997 (14.10.97) US 60/087,991 4 June 1998 (04.06.98) US		(74) Agents: PRATT, John, S. et al.; Kilpatrick Stockton LLP, Suite 2800, 1100 Peachtree Street, Atlanta, GA 30309-4530 (US).	
(63) Related by Continuation (CON) or Continuation-in-Part (CIP) to Earlier Applications  US 60/062,085 (CON) Filed on 14 October 1997 (14.10.97) US 60/087,991 (CON) Filed on 4 June 1998 (04.06.98)		(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).	
(71) Applicant (for all designated States except US): INTERFACE, INC. [US/US]; Suite 2000, 2859 Paces Ferry Road, Atlanta, GA 30339 (US).		Published <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i>	
(54) Title: FLOOR COVERING WITH WOVEN FACE			
(57) Abstract  Flooring that utilizes sophisticated, self-stabilizing, woven face fabric using relatively heavy "carpet weight" nylon, polyester, PTT or other yarns on modern Jacquard computer controlled looms to produce flat-weave fabrics that are bonded to engineered backing structures. Urethane modified bitumen may be used as a backing layer, and an optional latex precoat may be used on the fabric layer, together with an optional antimicrobial in the precoat.			

We claim:

1. Floor covering, comprising:
  - 2 a woven fabric top layer,
  - 3 a backing layer positioned below the fabric top layer, and
  - 4 a backing fabric below the backing layer.
  
1. 2. The floor covering of claim 1, further comprising a reinforcement web under the backing layer.
  
1. 3. The floor covering of claim 1, in which the woven fabric top layer is 2 woven on a jacquard loom.
  
1. 4. The floor covering of claim 3, in which the woven fabric comprises 2 polyester yarn.
  
1. 5. The floor covering of claim 4, in which the polyester is selected from 2 the group of polyethylene terephthalate, polybutylene terephthalate, 3 poly(trimethylene terephthalate), poly(1,4-dimethylenecyclohexane terephthalate), 4 poly(ethylene 2,6-naphthalene-dicarboxylate), and polylactic acid.
  
1. 6. The floor covering of claim 3, in which the woven fabric top layer 2 comprises yarn of 600 to 3600 denier (total yarn denier) having 8 to 80 denier per 3 filament.
  
1. 7. The floor covering of claim 6, in which yarn in the woven fabric top 2 layer comprises yarns of 600 and 2400 total yarn denier having 20 denier per 3 filament.

1           8.    The floor covering of claim 4, in which the polyester yarn comprises  
2    PTT yarn.

1           9.    The floor covering of claim 1, further comprising a precoat layer  
2    between the woven fabric top layer and the backing layer.

1           10.   The floor covering of claim 9, in which the precoat comprises highly  
2    frothed ethylene vinyl acetate or acrylic latex.

1           11.   The floor covering of claim 10, wherein the precoat is formed by  
2    applying a highly frothed ethylene vinyl acetate or acrylic latex to the underside of  
3    the woven fabric top layer.

1           12.   The floor covering of claim 11, in which the precoat further  
2    comprises an antimicrobial.

1           13.   The floor covering of claim 12, in which the antimicrobial comprises  
2    a phosphorus amine antimicrobial.

1           14.   The floor covering of claim 9, in which the precoat comprises a base  
2    latex, water, a foaming agent, thickener and flame retardant.

1           15.   The floor covering of claim 9, in which the precoat further comprises  
2    an antimicrobial.

1           16.   The floor covering of claim 1, further comprising a fabric stabilizing  
2    layer adjacent to the fabric top layer.

1        17. The floor covering of claim 16, in which the fabric stabilizing layer  
2    comprises a web of non-woven fiberglass fleece.

1        18. The floor covering of claim 1, in which the backing fabric comprises  
2    woven polypropylene carpet backing.

1        19. The floor covering of claim 1, further comprising a resilient layer  
2    positioned between the fabric top layer and the backing layer.

1        20. The floor covering of claim 19, in which the backing layer is  
2    urethane-modified bitumen.

1        21. The floor covering of claim 20, in which the backing layer weighs  
2    between approximately 10 and 60 ounces per square yard.

1        22. The floor covering of claim 2, further comprising a resilient layer  
2    between the backing layer and the backing fabric.

1        23. The floor covering of claim 22, in which the resilient layer comprises  
2    polyurethane foam.

1        24. The floor covering of claim 2, in which the reinforcement web  
2    comprises non-woven fiberglass fleece.

1        25. The floor covering of claim 24, in which the fiberglass fleece weighs  
2    approximately 1.3 ounces per square yard.

1        26. Floor covering comprising:  
2            (a) a woven fabric top layer comprising polyester yarn,

1           27. The floor covering of claim 26, further comprising a latex precoat  
2 containing an antimicrobial on the underside of the woven fabric top layer.

1           28. A method for producing floor covering, comprising the steps of:

2                   (a) weaving a face fabric on a loom,

3                   (b) forming a layer of resilient material,

4                   (c) bonding the resilient layer to a web of backing fabric,

5                   (d) forming a backing layer,

6                   (e) positioning a reinforcement web between the backing layer and

7                   the resilient layer,

8                   (f) bonding the backing layer and resilient layer together with the

9                   reinforcement web between the backing and resilient layers, and

10                   (g) bonding the face fabric to the backing layer.

1           29.    The method for producing floor covering of claim 28, in which the  
2    face fabric is woven on a jacquard loom.

1           30. The method for producing floor covering of claim 28, in which the  
2 resilient material comprises polyurethane foam.

1           31.    The method for producing floor covering of claim 28, in which the  
2    backing fabric comprises woven polypropylene.

1           32.    The method for producing floor covering of claim 28, in which the  
2    backing layer comprises urethane modified bitumen.

1           33.    The method for producing floor covering of claim 28, in which the  
2    reinforcement web comprises nonwoven fiberglass fleece.

1           34.    The method for producing floor covering of claim 28, further  
2    comprising the step of applying a precoat to the face fabric before bonding the face  
3    fabric to the backing layer.

1           35.    The method for producing floor covering of claim 34, further  
2    comprising the step of incorporating an antimicrobial in the precoat.

1           36.    A method for providing a continuous floor covering on a floor  
2    comprising the steps of:

3               (a)    positioning on the floor sections of floor covering completely  
4    covering the floor area to be covered, the floor covering comprising a woven fabric  
5    top layer, a bottom layer of woven polypropylene carpet backing, and at least one  
6    layer between the woven fabric top layer and the woven polypropylene carpet  
7    backing,

8               (b)    cutting the floor covering so that edges of adjacent sections of  
9    floor covering are abutting,

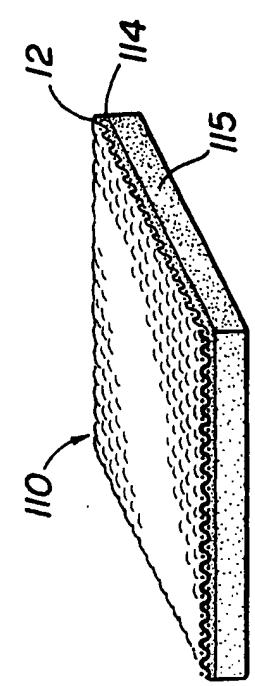
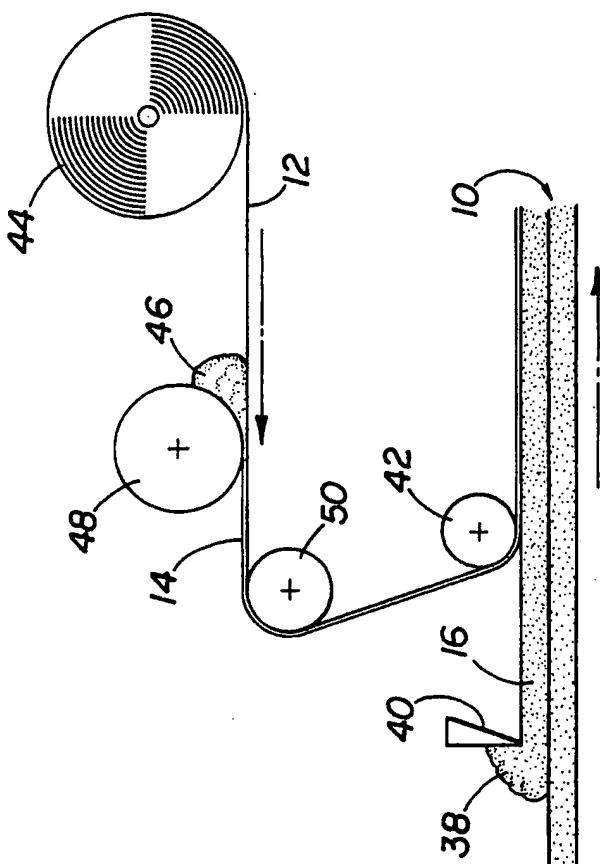
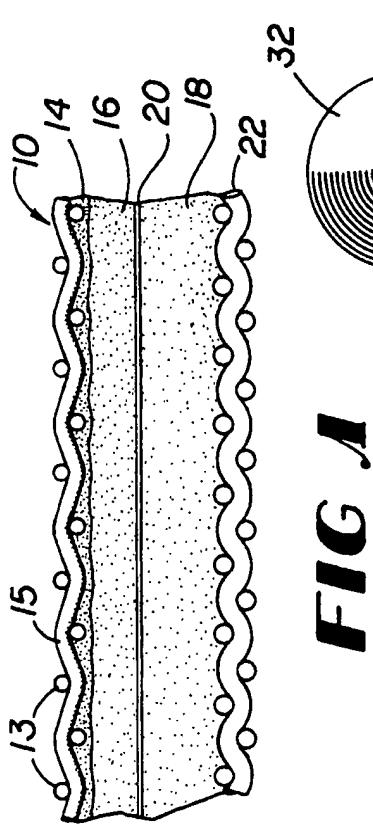
10              (c)    applying adhesive between the underside of the carpet sections  
11    and the floor,

12              (d)    applying fabric edge sealer to adjacent fabric top layer edges,

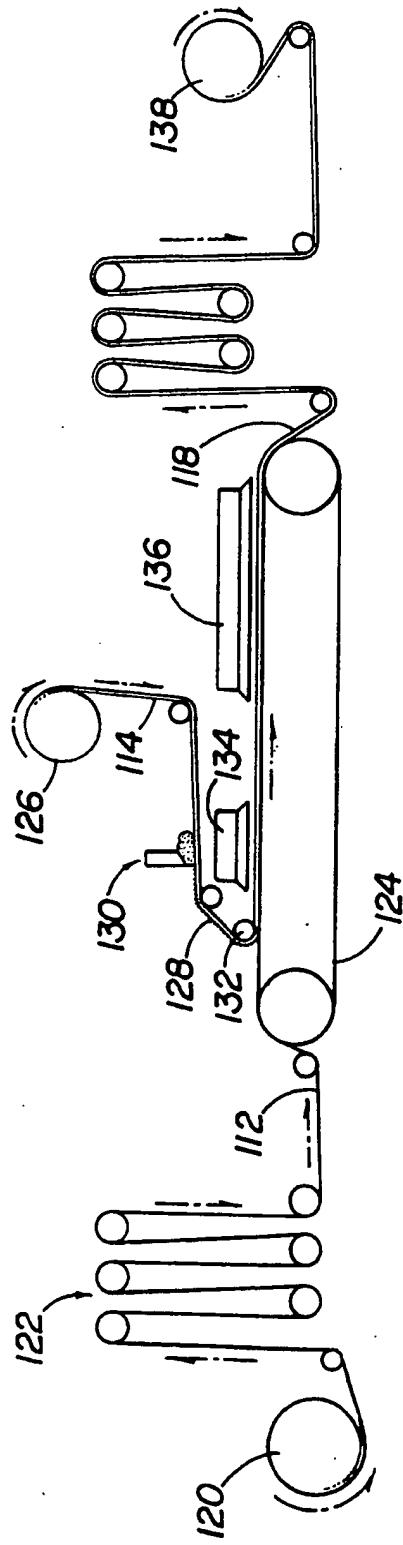
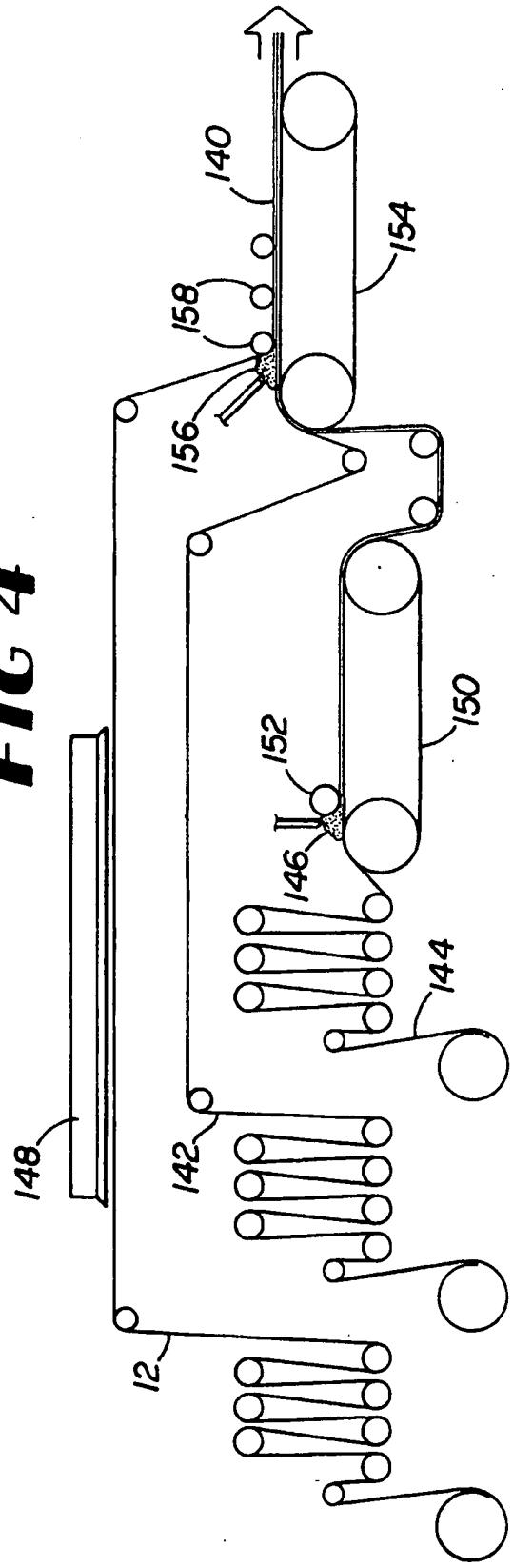
13 (e) applying carpet seam sealer to at least adjacent carpet backing  
14 edges, and

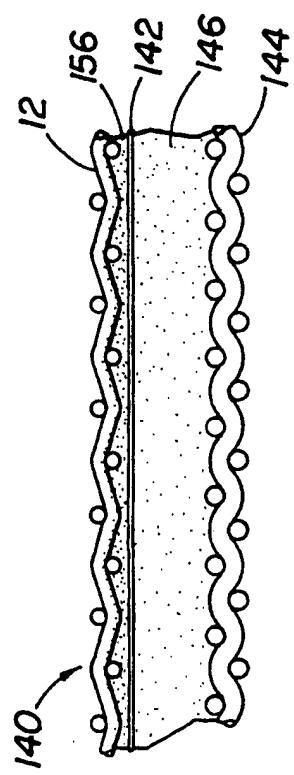
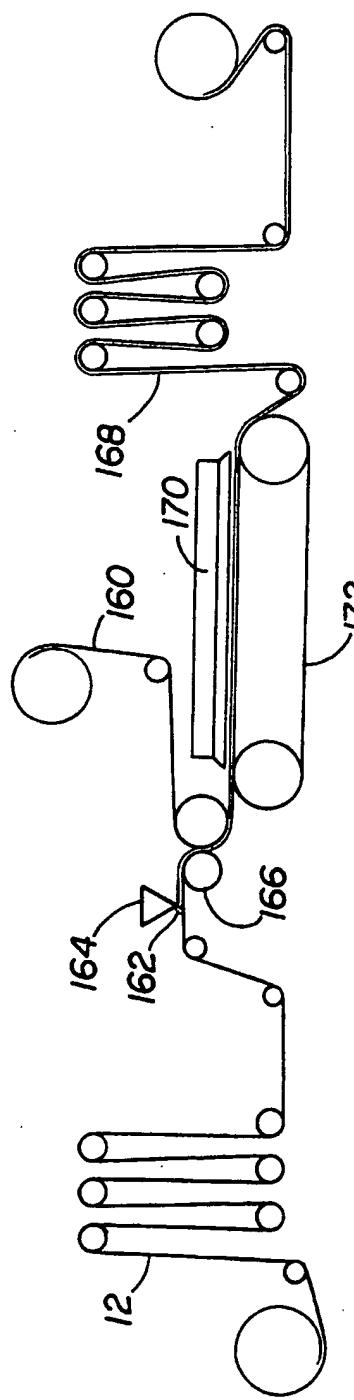
15 (g) with the floor covering sections positioned on the floor with  
16 edges positioned in abutting relationship, permitting the adhesive, seam sealer and  
17 fabric edge sealer to cure.

1           37. The method for providing a continuous floor covering of 36, in which  
2       the fabric edge sealer is a polyester urethane.



**FIG 3**

**FIG 4****FIG 5**



## INTERNATIONAL SEARCH REPORT

International Application No  
PCT/US 98/21487A. CLASSIFICATION OF SUBJECT MATTER  
IPC 6 D06N7/00 A47G27/04

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)  
IPC 6 D06N A47G

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	DE 16 35 484 A (DELDEN & CO.) 13 May 1971  see page 2, paragraph 1; claim; figures	1,2,9, 15-17, 22-25
Y	WO 93 08325 A (INTERFACE INC) 29 April 1993	1,2,9, 15-17, 22-25
A	see the whole document	28
Y	WO 95 23691 A (MILLIKEN RES CORP) 8 September 1995 see the whole document	2,22-25
Y	WO 90 14107 A (INTERFACE INC) 29 November 1990 see claims 1,4,9,10	15
		-/-

 Further documents are listed in the continuation of box C. Patent family members are listed in annex.

## \* Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

- "T" later document published after the International filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- "&" document member of the same patent family

Date of the actual completion of the international search  16 March 1999	Date of mailing of the international search report  23/03/1999
Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Authorized officer  Pamies Olle, S

## INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 98/21487

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	DE 92 18 998 U (CARL HERDING GMBH & CO KG) 28 November 1996 see claims ----	1
A	DE 296 00 724 U (LONGLIFE TEPPICHBODEN BERNDT C) 13 February 1997 see page 2, last line - page 3, line 5; claims 1,5; figures ----	1
A	DE 94 16 152 U (KOCH GUNNAR) 15 December 1994 see page 6, paragraph 2 - paragraph 3; claims; figure see page 8 ----	1
A	US 2 752 277 A (W.R. KEEN) 26 June 1956 ----	1
A	US 2 622 998 A (W.F. STAHL) 23 December 1952 -----	1

**INTERNATIONAL SEARCH REPORT**

Information on patent family members

International Application No

PCT/US 98/21487

Patent document cited in search report	Publication date	Patent family member(s)		Publication date
DE 1635484	A 13-05-1971	NONE		
WO 9308325	A 29-04-1993	CA 2122003 A		29-04-1993
		AU 658856 B		04-05-1993
		EP 0609208 A		10-08-1994
		JP 8016312 B		21-02-1996
		JP 7502569 T		16-03-1995
WO 9523691	A 08-09-1995	US 5545276 A		13-08-1996
		AU 689866 B		09-04-1998
		AU 1933695 A		18-09-1995
		CA 2184090 A		08-09-1995
		EP 0748278 A		18-12-1996
		JP 9509855 T		07-10-1997
		US 5540968 A		30-07-1996
WO 9014107	A 29-11-1990	US 5024840 A		18-06-1991
		AU 641602 B		23-09-1993
		AU 5664590 A		18-12-1990
		CA 2031196 A		16-11-1990
		DE 69031265 D		18-09-1997
		DE 69031265 T		22-01-1998
		EP 0431094 A		12-06-1991
		JP 3503378 T		01-08-1991
		JP 4033463 B		03-06-1992
		KR 9501383 B		18-02-1995
DE 9218998	U 28-11-1996	DE 4234254 A		14-04-1994
DE 29600724	U 13-02-1997	NONE		
DE 9416152	U 15-12-1994	NONE		
US 2752277	A 26-06-1956	NONE		
US 2622998	A 23-12-1952	NONE		